

UNIVERSITY OF GEORGIA

**Fertility Effects on Creeping Bentgrass Pest, Water and Root Relationships**

1991 Research Grant: \$5,679  
(Second year of support)

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Creeping bentgrass (*Agrostis palustris* Huds.) is the preferred species for golf greens in the upper South. The hot, humid environment of the Southeast, however, results in substantial high temperature and disease stress on this cool-season species. Dr. Milt Engelke, Texas A&M University, has an extensive bentgrass breeding program to develop bentgrass cultivars that will exhibit improved adaptation to summer stresses. The objectives of this project were to compare three of Dr. Engelke's experimentals with two industry standards for 1) root growth and water extraction patterns in the summer months, 2) shoot growth, and 3) disease and insect tolerances. The five bentgrasses included Penncross, Pennlinks, SYN-1-88, SYN-3-88, and SYN-4-88.

To define appropriate cultural regimes, two nitrogen fertility programs and two fungicide programs were included for each species. The annual fertility programs were 3.5 lb nitrogen and 7.0 lb nitrogen per 1000 ft<sup>2</sup>, while the two fungicide programs were preventative and curative. The preventative program was based on the use of a number of fungicides applied on a preventative (to prevent disease appearance) schedule. For the curative program, substantial disease development was allowed before curative rates of a fungicide were applied. This allowed disease infection and recovery from disease to be monitored. The mowing height was 5/32 inch with clippings removed. The site was a 5-year old USGA specification golf green at Griffin, GA. Establishment of the bentgrass was in September 1990.

During the August-September period when continuous summer stresses often cause bentgrass to deteriorate, SYN-4-88 demonstrated the highest visual quality, color, and shoot density of all cultivars under the high nitrogen preventative fungicide regime. SYN-3-88 also performed very well under these conditions. At the low nitrogen preventative fungicide treatments, best visual quality was noted for SYN-3-88 followed by SYN-4-88.

Very severe brown patch and dollar spot disease pressures were apparent in 1991. Under a preventative fungicide program, the lowest brown patch infection occurred on SYN-4-88 and Penncross, while SYN-1-88 was most susceptible. With the curative program, SYN-3-88 and Penncross demonstrated the least infection. For dollar spot, SYN-3-88 was most susceptible.

Root samples by depth and water extraction by depth data were obtained in early July and late August. Samples and data are under preparation.